Engineering and Operations Workgroup Study Plans

Study #1c: Oroville Reservoir Temperature Model Development

November 16, 2001

Goals

- Develop appropriate Oroville Reservoir temperature model to simulate release temperature
- Integrate into the overall modeling scheme
- Perform benchmark simulations

Task 1. Define desired outputs from model

- Includes:
  - Oroville release temperature
  - Oroville reservoir profile at intake structure

Task 2. Review existing models

- USBR Temperature Model
  - Monthly time step
  - Limited verification and use
- USCE developed HEC-5Q model
  - Daily time step
  - Developed for USCE training purposes

Task 3. Review existing data

- Typical data required includes
  - Physical facility and inlet structure
  - Reservoir operations (inflow, release, storage, etc)
  - Climatic data (temperature, solar radiation, wind, etc.)

Task 4. Review modeling tools

- Modeling tools include:
  - WQRRS (1-D)
  - RMA (1-D)
  - BETTER (1-D)
  - CE-QUAL-W2 (2-D)
  - MIKE-11 (1D)

Task 5. Select appropriate model or modeling tool

- Based on the results of task 1 through 4 select the appropriate model/modeling tool to create the Oroville Reservoir temperature model for this process
- Get approval from plenary group

Task 6. Collect field data for development, calibration, and verification

- Identify additional data required
- Install instrumentation as required
- Collect data

Task 7. Model Development, Calibration, and Verification

- Define system to be modeled and schematic to be used
- Develop physical system definition in model
- Develop time-series input data (hydrologic, operational)
- Calibrate model
- Verify completed model

Task 8 – Integrate into modeling scheme

- Use definitions from Study Plan 1, Tasks 1 and 5
- Finalize transfer utilities and process

Task 9. Perform benchmark simulations

- Get boundary conditions from central modeling database
- Perform the actual simulations
- Use utility programs to load data into central modeling database

Products

- Oroville Reservoir temperature model
- Benchmark Oroville Reservoir temperature simulation results